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DISCOVERY OF CAMBRIAN ROCKS IN SOUTHEASTERN CALIFORNIA

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During a recent trip in the desert region of southeastern California, I discovered an extensive series of fossiliferous Cambrian rocks in the vicinity of the Santa Fé Railroad. The locality is on the south end of a ridge known as Iron Mountain, 2 miles northwest of Siam Siding, in the eastern part of San Bernardino County. The rocks constitute the summit of the ridge and dip down its eastern slope. They lie on granite which rises several hundred feet up the western side. The adjoining country is a desert plain, but the ridge extends far to the northward. My opportunities for determining the structure and stratigraphy were limited, and only a partial section was measured. It comprises the following beds:

	Feet
Shales and sandstones	200+
Limestone	6
Gray shales	50
Limestone	8
Gray shales with few limestone and sandstone layers	250
Nodular limestone	25
Massive hard dark-blue limestone	50
Gray shales with calcareous sandstone layers	20
Gray sandstones and quartzites	500
Dark hard quartzites, conglomeratic at base	60
Granite	

Fossils were found in the limestone layers in the gray shales above the nodular limestone, and also in the gray shales below the 50-foot bed of dark-blue limestone. They consisted of fragments of trilobites and molluscs, which proved to be not specifically determinable, but Mr. C. D. Walcott believes them to be undoubtedly of Cambrian age, probably Middle Cambrian.

The contact with the granite is clearly exposed and was traced for about a mile. It is unquestionably a shore line and not a contact of

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intrusion. Therefore the granites are of pre-Cambrian age. At one locality the granite is traversed by a dike of black basic rock on which the basal Cambrian conglomerates lie. As some of the granites of southern California are post-Paleozoic, it was of interest to find that the granite in Iron Mountain, at least, is of pre-Cambrian age.

In the vicinity of the gold mine, 2 miles southeast of Siam and almost in the line of strike of Iron Mountain, another high ridge consists of limestone and quartzite cut by a dark-colored, coarse-grained

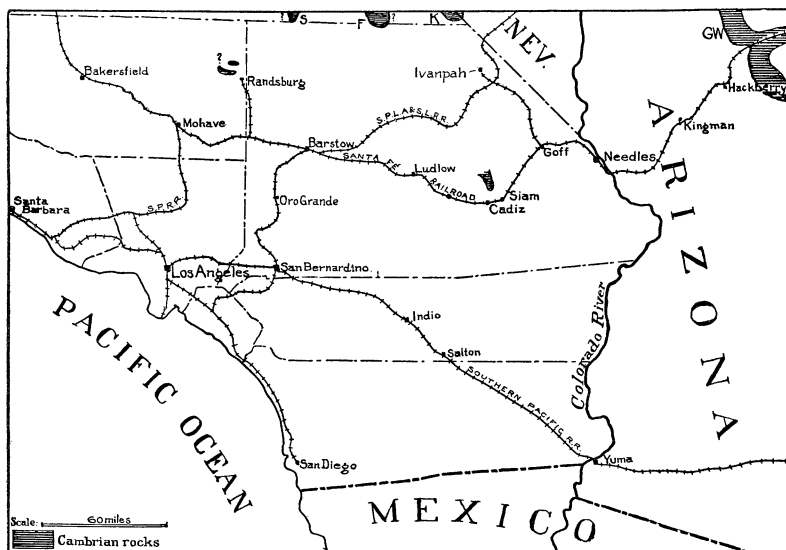


FIG. 1.—Sketch map of the southern California region showing occurrences of Cambrian rocks. GW, Grand Wash escarpment; K, Kingston Range; F, south end of Funeral Range; S, Slate Range.

granite. The exposure shows 200 feet or more of quartzite, overlain by greenish shale, capped by 800 feet of semi-crystalline limestone. No fossils were found, but some features of the limestone suggest that it may represent the Red Wall limestone of the Grand Canyon region 200 miles northeast. The quartzite lies on granite at this locality, but granite also cuts irregularly across the limestone, and apparently has caused its alteration.

The rocks above described are in the middle of a wide area of which the geology has never been studied. The location is shown in

Fig. 1, in which are also indicated the nearest occurrences of Cambrian rocks previously known. At GW is the Grand Wash escarpment on the western margin of the Arizona plateau traversed by the Grand Canyon of the Colorado. In this escarpment is the well-known succession of 1,000 feet or more of the Tonto (Middle Cambrian) sandstones and shales lying on pre-Cambrian granites and overlain by several thousand feet of Carboniferous limestones.

Cambrian rocks have been described by J. E. Spurr¹ on several ranges in the southern portion of Inyo County, extending to and slightly over the northern margin of San Bernardino County. These descriptions were based partly on his own observations and partly on notes of a trip made by Mr. R. B. Rowe. The most extensive areas which are in and near the Kingston Range (K; Fig. 1) were discovered by Mr. Rowe. The rocks here consist of over 1,500 feet of quartzites of various colors and limestone, sandstones, and shales. One mass of massive dark-blue limestone is mentioned. The rocks contain fossils at different horizons, some of which are stated to be lower Cambrian. They lie on gneisses and other crystalline rocks. In the southern end of the Funeral Range (F. in Fig. 1) there are about 2,000 feet of slates, limestones, conglomerates, and quartzites noted by Gilbert² and Campbell.³ These observers found no fossils and Campbell suggests that the rocks may be of pre-Cambrian age. Mr. Spurr maps them as probable Cambrian. Some of the beds in Slate Range (see Fig. 1) and west of Randsburg are mapped as Cambrian by Spurr on the authority of H. N. Fairbanks,⁴ who refers to them as "probably Paleozoic."

In the White Mountain Range, over 100 miles north, there are nearly 5,000 feet of sandstones, shales, quartzites, and limestones, in which Mr. Walcott⁵ discovered an extensive series of Lower Cambrian fossils. In certain parts of the range the rocks are cut by great masses of intrusive granite.

In the Spring Mountain and Las Vegas regions, southern Nevada,

¹ U. S. Geological Survey, *Bulletin No. 208* (Washington, 1903).

² U. S. *Geographical Survey West of the 100th Meridian*, Vol. III, p. 170.

³ U. S. Geological Survey, *Bulletin No. 200*, p. 14 (Washington, 1902).

⁴ *American Geologist*, Vol. XVII, pp. 65, 149.

⁵ *American Journal of Science, Third Series*, Vol. XLIX (1895), pp. 141-44.

Spurr¹ reports sandstones, limestones, and other rocks containing fossils probably of Middle Cambrian age.

Quartzites and crystalline limestones occurring just east of Oro Grande station believed to be Cambrian by Hershey² but no fossils were found in them.

¹ *Loc. cit.*, pp. 155, 165.

² *American Geologist*, Vol XXIX, p 288.